In the Claims:

Please amend the claims as follows:

1. (currently amended) A method to increase a safety integrity level of a single ~~safety~~ controller for control of real world objects, the method comprising:

attaching to the single ~~safety~~ controller a safety-hardware unit wherein the safety-hardware unit communicates with a central processing unit of the single ~~safety~~ controller, <u>wherein the safety-hardware unit is used only for safety-critical control,</u>

connecting a bus to the single ~~safety~~ controller and connecting an input/output unit to the bus,

downloading safety-related configuration data and/or diagnostic information to the attached safety-hardware unit and downloading a control function software to the single ~~safety~~ controller,

configuring the attached safety-hardware unit to execute logic, which depends on the downloaded safety-related configuration data and/or diagnostic information,

actively or passively setting output values of the single ~~safety~~ controller to a safe state for online safety control,

obtaining access to a plurality of input and output values of a real world object through the bus, and

verifying a validity of ~~the~~ bus communication with the attached safety hardware unit.

2. (currently amended) The method according to claim 1, wherein the single ~~safety~~

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controller has the capability of executing a set of non-safety critical control functions, which set

of non-safety critical control functions is the same before as well as after the safety hardware unit

is attached.

3. (currently amended) The method according to claim 2, wherein the configuring

comprises:

downloading to the attached safety hardware unit diagnostic information, which

previously was automatically generated by a software tool as a result of user's configuration of

the single ~~safety~~ controller and which diagnostic information is used in the attached safety

hardware unit during safety critical control.

4. (cancelled)

5. (previously amended) The method according to claim 1, wherein the timing

supervision of the controller is verified in the attached safety hardware unit.

6. (previously amended) The method according to claim 1, wherein correct sequence of

code logic is verified in the attached safety hardware unit.

7. (previously amended) The method according to claim 1, wherein correctness of

memory content of the controller is verified in the attached safety hardware unit.

8. (previously amended) The method according to claim 1, wherein a download of new

control functionality logic to the controller is verified in the attached safety hardware unit.

9. (previously amended) The method according to claim 1, wherein the attached safety hardware unit performs checks in order to allow only users logged on as safety classified engineers and safety classified operators to modify the control functionality logic and parameters.

10. (currently amended) The method according to ~~claim 4~~ <u>claim 1</u>, wherein ~~the~~ <u>a</u> bus communication verification logic in the attached safety hardware unit is implemented diverse.

11. (currently amended) The method according to ~~claim 4~~ <u>claim 1</u>, wherein the attached safety hardware unit is diverse generating a safety related header for the bus communication.

12. (previously amended) The method according to claim 11, wherein the input/output unit has two diverse implementations each verifying the correctness of the bus traffic and each generating a safety related header for the bus communication.

13. (previously amended) The method according to claim 1, wherein the attached safety hardware unit comprises a first and a second module in a redundant configuration, the second module is updated with data that exists first module at the time of a failure and the second module takes over the safety related control of the control system from the first module if a failure of the first module is detected.

14. (currently amended) The method according to claim 13, wherein ~~the~~ a redundant controller unit is attached to the single ~~safety~~ controller, wherein the redundant controller ~~which~~ takes over in case of a failure of a primary controller, and wherein ~~and~~ the redundant controller unit ~~establish~~ establishes communication with either the active first module or the active second module of the attached safety hardware unit.

15. (currently amended) A single or 1-channel control system intended for safety-related control of real-world objects, comprising:

a single main central processing unit handling main processes of a single ~~safety~~ controller, the single controller comprising a bus configured to obtain access to a plurality of input and output values of a real world object, the single controller further comprising a central processing unit, wherein the single controller is configured to download a control function software, and wherein the single controller is configured such that output values may be actively or passively set to a safe state for online safety control,

a safety-hardware unit attached to said single ~~safety~~ controller, the safety-hardware unit comprising means to increase a safety-integrity level of the single ~~safety~~ controller and comprising means to set output values of the single ~~safety~~ controller in a safe state for online safety control, wherein the safety-hardware unit communicates with the central processing unit of the single controller, wherein the safety-hardware unit is used only for safety-critical control, herein the safety-hardware unit is configured to download safety-related configuration data and/or diagnostic information, wherein the safety-hardware unit is configured to execute logic that depends on the downloaded safety-related configuration data and/or diagnostic information, and wherein the safety-hardware unit is configured to verify a validity of bus communication,

<u>and</u>

> <u>an input/output unit connected to the bus of the single controller.</u>

16. (currently amended) The control system according to claim 15, wherein the single ~~safety~~ controller has the capability of executing a set of non-safety critical control functions, which set of non-safety critical control functions is the same before as well as after the safety hardware unit is attached.

17. (previously amended) The control system according to claim 16, further comprising:

> means for downloading to the attached safety hardware unit diagnostic information, which previously was automatically generated by a software tool as a result of user's configuration of the controller and which diagnostic information is used in the attached safety hardware unit during safety critical control.

18. (cancelled)

19. (currently amended) The control system according to claim 18, wherein ~~the~~ <u>a</u> bus communication verification logic in the attached safety hardware unit is implemented diverse.

20. (previously amended) The control system according to claim 19, wherein the attached safety hardware unit is diverse generating a safety related header for the bus communication.